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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,380	06/27/2003	Toshiyuki Miyamoto	50212-512	5140

20277 7590 01/11/2006

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EXAMINER

HUGHES, DEANDRA M

ART UNIT PAPER NUMBER

3663

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/607,380	<b>Applicant(s)</b> MIYAMOTO ET AL.	
	<b>Examiner</b> Deandra M. Hughes	<b>Art Unit</b> 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10/24/05.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 30 and 31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 30 and 31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. A copy of the reference lined through on the IDS filed 12/6/04 has been received and considered. This reference is listed on the Form 892 transmitted herewith.

### ***Specification***

2. The objection to the abstract is withdrawn.

### ***Claim Rejections - 35 USC § 102***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claim 20 is rejected under 35 U.S.C. 102(e) as being anticipated by Adams (US 6,785,472 filed Jun. 15, 1999).

With regard to claim 20, Adams discloses:

- a transmitter (fig. 2, #130) transmitting widely spaced channel light of 20nm (col. 3, lines 13-30);
- an optical fiber transmission line transmitting the signal light (e.g. fig. 4, #311-316);
- an optical fiber for Raman amplification (e.g. fig. 4, links #311-316; Raman amplification occurs in transmission fibers);
- SRS means which Raman amplifiers the signal light in said optical fiber for Raman amplification, by supplying Raman amplification pumping light (col. 4, lines 64-68; col. 5, lines 1-46);

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- wherein the Raman amplification pumping light includes a plurality of pump *channels* (col. 6, lines 50-55), and reaches part of said optical transmission line via said optical fiber for Raman amplification (col. 5, line 30).

***Claim Rejections - 35 USC § 103***

5. Claims 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams (US 6,785,472 filed Jun. 15, 1999) in view of Agrawal (Fiber-Optic Communication Systems published May 28, 2002).

With regard to claim 23, col. 6, lines 5-6 disclose multiplexing the pumps to the transmission fiber. Further, the claim limitation "*wherein an optical frequency of each pumping channel contained in the pumping light is so set as to located a peak of Raman gain at an optical frequency different from an optical frequency of each signal channel contained in the signal light...*" (lines 10-12) is essentially a method limitation or a statement of intended or desired use. Thus, this claim limitation as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference. See In re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 512 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See MPEP § 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2nd 1647

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP § 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

Since Adams meets the structural elements of the claim limitations, the Examiner has reason to believe that the prior art structure can achieve the intended use. In particular, one may merely tune the Raman pumps to one Stokes shift away from an optical frequency different from an optical frequency of each signal channel contained in the signal light.

However, Adams does not specifically disclose that the optical frequency spacing between the adjacent pumping channels in the pumping light is 4,680 GHz or more. Agrawal teaches pump channel spacings of 4,680 GHz or more in adjacent pump channels (e.g. fig. 6.14, pg. 250) of a Raman amplifier with the claimed transmitter bandwidth. It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to use the limit the pump channel spacings to 4,680 GHz or more for the advantage of limiting detrimental pump-to-pump interactions, as is specifically taught by Agrawal (pg. 249, 2<sup>nd</sup> paragraph).

6. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adams (US 6,785,472 filed Jun. 15, 1999) in view of Muro (US 6,823,107 filed Mar. 11, 2002).

Adams does not specifically disclose that the transmission fiber for Raman amplification has a negative chromatic dispersion at each signal channel. However, Muro teaches the use of a negative chromatic dispersion fiber (fig. 11, #44 and col. 9, line 31) at each channel. It would have been obvious to one of ordinary skill (e.g., an

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optical engineer) in the art at the time the invention was made to use a negative chromatic dispersion transmission fiber as a Raman amplifying fiber for the advantage of obtaining the required gain, as is specifically taught by Muro (col. 9, line 37).

7. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams (US 6,785,472 filed Jun. 15, 1999) in view of Agrawal (Fiber-Optic Communication Systems published May 28, 2002) as applied to claim 23 above, and further in view of Muro (US 6,823,107 filed Mar. 11, 2002).

Adams in view of Agrawal does not specifically disclose that the transmission fiber for Raman amplification has a negative chromatic dispersion at each signal channel. However, Muro teaches the use of a negative chromatic dispersion fiber (fig. 11, #44 and col. 9, line 31) at each channel. It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to use a negative chromatic dispersion transmission fiber as a Raman amplifying fiber for the advantage of obtaining the required gain, as is specifically taught by Muro (col. 9, line 37).

8. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adams (US 6,785,472 filed Jun. 15, 1999) in view of Eggleton (US 6,768,577 filed Mar. 15, 2002).

Adams does not specifically disclose that the Raman pumps have a plurality of longitudinal modes, i.e. they are multimode pumps. However, Eggleton teaches Raman multimode pumps (col. 2, line 61). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to use

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multimode pumps for the advantage of reducing detrimental Brillouin scattering, as is specifically taught by Eggleton (col. 2, line 63).

9. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adams (US 6,785,472 filed Jun. 15, 1999) in view of Eggleton as applied to claim 30 above, and further in view of Muro (US 6,823,107 filed Mar. 11, 2002).

Adams in view of Eggleton does not specifically disclose that the transmission fiber for Raman amplification has a negative chromatic dispersion at each signal channel. However, Muro teaches the use of a negative chromatic dispersion fiber (fig. 11, #44 and col. 9, line 31) at each channel. It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to use a negative chromatic dispersion transmission fiber as a Raman amplifying fiber for the advantage of obtaining the required gain, as is specifically taught by Muro (col. 9, line 37).

#### ***Claim Rejections - 35 USC § 112***

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 22 and 26-29 are rejected under 35 U.S.C. 112, first paragraph.

With regard to claims 22 and 26, the specification, while being enabling for a nonlinear refractive index of  $3.5 \times 10^{-20} \text{ m}^2/\text{W}$ , does not reasonably provide enablement for a nonlinear refractive index in the range of  $3.5 \times 10^{-20} \text{ m}^2/\text{W}$  or more (i.e., to infinity).

With regard to 27 and 28, the specification, while being enabling for signal light of 12.48 THz does not reasonably provide enablement for a signal light of 12.48 THz *or less* (i.e., to zero).

With regard to claim 29, the specification, while being enabling for  $MPI_{\text{crosstalk}}$  of 30 dB does not reasonably provide enablement for a  $MPI_{\text{crosstalk}}$  of 30 dB *or less* (i.e., to zero).

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

### ***Response to Arguments***

12. With regard to claim 20, applicant's arguments filed 10/24/05 have been fully considered but they are not persuasive.

Applicant argues that Adams does not Raman amplification using two or more pumping channels (pg. 8, lines 14-18). This argument is not persuasive because col. 6, lines 50-60 clearly discloses Raman amplification using two or more pumping channels (note: "it will be advantageous in at least some networks to employ two or more pumps emitting *at different wavelengths*", emphasis mine).

13. Applicant's arguments with respect to claims 21-31 have been considered but are moot in view of the new ground(s) of rejection.

### ***Allowable Subject Matter***

14. Claims 22 and 26-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the



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limitations of the base claim and any intervening claims **and** if the 112-1<sup>st</sup> rejection outlined above is overcome.

### ***Conclusion***

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M. Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Deandra M. Hughes  
Examiner  
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